

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An image sensing apparatus using an image sensing element which has a plurality of pixels arrayed in horizontal and vertical directions, wherein:

the image sensing element includes an effective pixel area which outputs signal of an object image, a first reference pixel area which outputs a first reference signal for DC signal recovery, and a second reference pixel area which outputs a second reference signal for DC signal recovery,

wherein a pixel in the first reference pixel area is shielded from light and does not have a photoelectric conversion element, and

wherein a pixel in the second reference pixel area is shielded from light and has a photoelectric conversion element and outputs a signal including dark current component generated in the photoelectric conversion element,

said image sensing apparatus comprising:

a first correction unit adapted to DC recovery correct signals of the effective pixel area by subtracting the first reference signal with respect to each corresponding horizontal line; and

a second correction unit adapted to DC recovery correct signals of the effective pixel area, which are corrected by said first correction unit, while by evenly subtracting a representative value which is based on the second reference signal from each signal of a plurality of horizontal lines of the effective pixel area.

Claim 2 (original): The apparatus according to claim 1, wherein

the first reference signal includes a signal free from influence of a signal converted by a photoelectric conversion element of the image sensing element, and

the second reference signal includes a signal containing a dark current component generated in the photoelectric conversion element of the image sensing element.

Claim 3 (original): The apparatus according to claim 2, wherein the second reference signal includes a signal obtained in a region which includes the photoelectric conversion element in the image sensing element and is shielded from incident light.

Claim 4 (original): The apparatus according to claim 3, wherein the first reference signal includes a signal obtained in a region which does not include the photoelectric conversion element in the image sensing element.

Claim 5 (original): The apparatus according to claim 3, wherein the first reference signal includes a signal output from a reference power supply for each row of the predetermined pixel region.

Claim 6 (previously presented): The apparatus according to claim 1, wherein said second correction unit has a storage device which stores the signal from the effective pixel area, a calculation device which calculates a representative value of the second reference signal, and a subtraction device which subtracts the representative value of the second reference signal that is calculated by the calculation device, from the signal from the effective pixel area that is stored in the storage device.

Claim 7 (previously presented): The apparatus according to claim 6, wherein the calculation device has a calculation device which calculates representative values of the second

reference signal for a plurality of regions obtained by dividing the region which includes the photoelectric conversion element in the image sensing element and is shielded from incident light, and a device which outputs to the subtraction device a lowest value among the representative values of the plurality of regions that are calculated by the calculation device.

Claim 8 (original): The apparatus according to claim 6, wherein the representative value includes any one of an average value, a median, and a mode.

Claim 9 (previously presented): An image sensing apparatus comprising:
a photoelectric conversion region which includes two-dimensionally arrayed photoelectric conversion elements;

a first correction unit which corrects a signal from the photoelectric conversion region by subtracting a first reference signal common to each line; and

a second correction unit which corrects the signal from the photoelectric conversion region on the basis of a second reference signal common to signals from the two-dimensionally arrayed photoelectric conversion elements,

wherein the first reference signal includes a signal free from influence of a signal generated by the photoelectric conversion element, and the second reference signal contains a dark current component generated in the photoelectric conversion element.

Claim 10 (original): The apparatus according to claim 9, wherein the second reference signal includes a signal from a photoelectric conversion element which is shielded from light in the photoelectric conversion region.